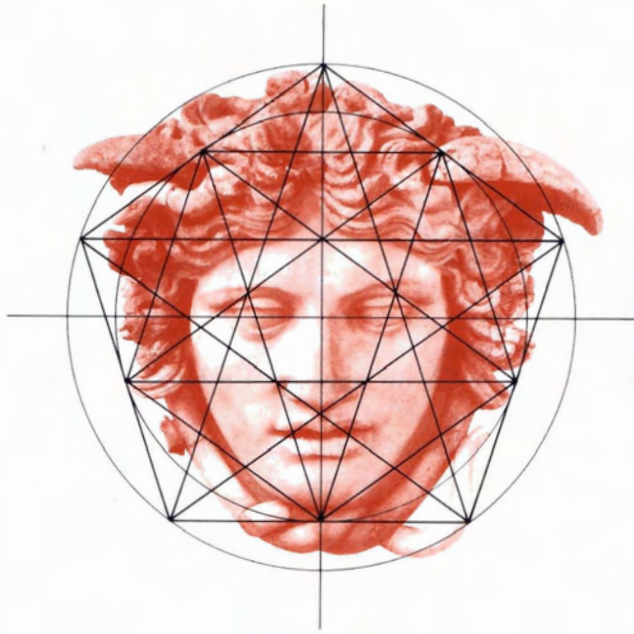


ROBERT LAWLOR

sacred geometry

PHILOSOPHY AND PRACTICE



with 202 illustrations and diagrams, 56 in two colours



Thames & Hudson

Introduction

In science today we are witnessing a general shift away from the assumption that the fundamental nature of matter can be considered from the point of view of substance (particles, quanta) to the concept that the fundamental nature of the material world is knowable only through its underlying patterns of wave forms.

Both our organs of perception and the phenomenal world we perceive seem to be best understood as systems of pure pattern, or as geometric structures of form and proportion. Therefore, when many ancient cultures chose to examine reality through the metaphors of geometry and music (music being the study of the proportional laws of sound frequency), they were already very close to the position of our most contemporary science.

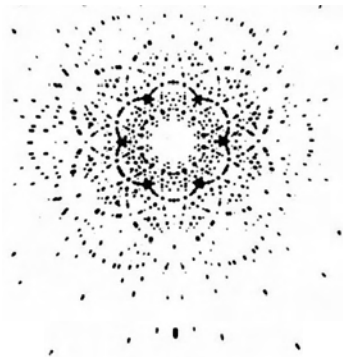
Professor Amstutz of the Mineralogical Institute at the University of Heidelberg recently said:

Matter's latticed waves are spaced at intervals corresponding to the frets on a harp or guitar with analogous sequences of overtones arising from each fundamental. The science of musical harmony is in these terms practically identical with the science of symmetry in crystals.

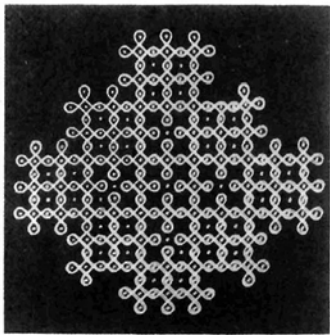
The point of view of modern force-field theory and wave mechanics corresponds to the ancient geometric-harmonic vision of universal order as being an interwoven configuration of wave patterns. Bertrand Russell, who began to see the profound value of the musical and geometric base to what we now call Pythagorean mathematics and number theory, also supported this view in *The Analysis of Matter*: 'What we perceive as various qualities of matter,' he said, 'are actually differences in periodicity.'

In biology, the fundamental role of geometry and proportion becomes even more evident when we consider that moment by moment, year by year, aeon by aeon, every atom of every molecule of both living and inorganic substance is being changed and replaced. Every one of us within the next five to seven years will have a completely new body, down to the very last atom. Amid this constancy of change, where can we find the basis for all that which appears to be consistent and stable? Biologically we may look to our ideas of genetic coding as the vehicle of replication and continuity, but this coding does not lie in the particular atoms (or carbon, hydrogen, oxygen and nitrogen) of which the gene substance, DNA, is composed; these are all also subject to continual change and replacement. Thus the carrier of continuity is not only the molecular composition of the DNA, but also its helix form. This form is responsible for the replicating power of the DNA. The helix, which is a special type from the group of regular spirals, results from sets of fixed geometric proportions, as we shall see in detail later on. These proportions can be understood to exist *apriori*, without any material counterpart, as abstract, geometric relationships. The architecture of bodily existence is determined by an invisible, immaterial world of pure form and geometry.

Modern biology increasingly recognizes the importance of the form and the bonding relationships of the few substances which comprise the molecular body of living organisms. Plants, for example, can carry out the process of photosynthesis only because the carbon, hydrogen, nitrogen and magnesium of the chlorophyll molecule are arranged in a complex twelvefold symmetrical pattern, rather like



X-ray diffraction pattern in beryl, indicating a patterned array of intervals surrounding a central node much like the pattern of partial overtones around a fundamental tone.



These geometric array patterns called *kolams* are drawn, with powdered chalk, by South Indian women on the doorstep each morning, to evoke the spirit of order and harmony into the home.

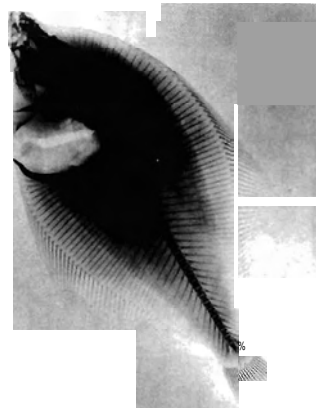
that of a daisy. It seems that the same constituents in any other arrangement cannot transform the radiant energy of light into life substance. In mythological thought, twelve most often occurs as the number of the universal mother of life, and so this twelvefold symbol is precise even to the molecular level.

The specialization of cells in the body's tissue is determined in part by the spatial position of each cell in relation to other cells in its region, as well as by an informational image of the totality to which it belongs. This spatial awareness on a cellular level may be thought of as the innate geometry of life.

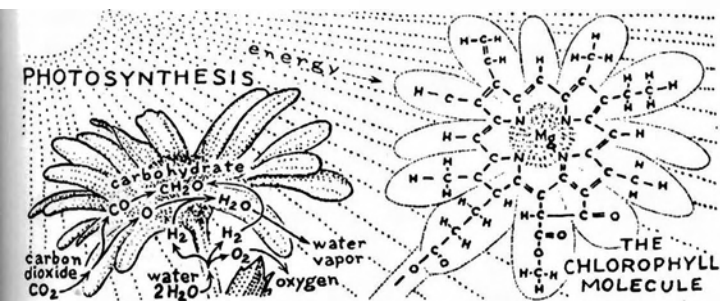
All our sense organs function in response to the geometrical or proportional – not quantitative – differences inherent in the stimuli they receive. For example, when we smell a rose we are not responding to the chemical substances of its perfume, but instead to the geometry of their molecular construction. That is to say, any chemical substance that is bonded together in the same geometry as that of the rose will smell as sweet. Similarly, we do not hear simple quantitative differences in sound wave frequencies, but rather the logarithmic, proportional differences between frequencies, logarithmic expansion being the basis of the geometry of spirals.

Our visual sense differs from our sense of touch only because the nerves of the retina are not tuned to the same range of frequencies as are the nerves embedded in our skin. If our tactile or haptic sensibilities were responsive to the same frequencies as our eyes, then all material objects would be perceived to be as ethereal as projections of light and shadow. Our different perceptual faculties such as sight, hearing, touch and smell are a result then of various proportioned reductions of one vast spectrum of vibratory frequencies. We can understand these proportional relationships as a sort of geometry of perception.

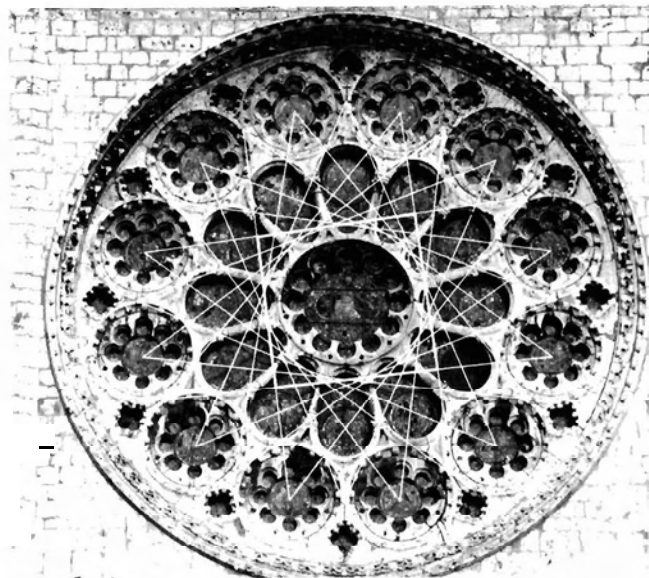
With our bodily organization into five or more separate perceptual thresholds, there is seemingly little in common between visual space, auditory space and haptic space, and there seems to be even less connection between these physiological spaces and pure, abstract metric or geometric space, not to mention here the differing awareness of psychological space. Yet all these modes of spatial being converge in the human mind-body. Within the human consciousness is the unique ability to perceive the transparency between absolute, permanent relationships, contained in the insubstantial forms of a geometric order, and the transitory, changing forms of our actual world. The content of our experience results from an immaterial, abstract, geometric architecture which is composed of harmonic waves of energy, nodes of relationality, melodic forms springing forth from the eternal realm of geometric proportion.



From the apparent world to the subatomic, all forms are only envelopes for geometric patterns, intervals and relationships.



Here we find twelvefold symmetry as the life-giver or womb which transforms light into the basic spectrum of organic substance. This is recalled symbolically in the stained-glass window, which transforms light into the colour spectrum.



I The Practice of Geometry

'What is God? He is length, width, height and depth.'

ST BERNARD OF CLAIRVAUX, *On Consideration*

'Geometry' means 'measure of the earth'. In ancient Egypt, from which Greece inherited this study, the Nile would flood its banks each year, covering the land and obliterating the orderly marking of plot and farm areas. This yearly flood symbolized to the Egyptian the cyclic return of the primal watery chaos, and when the waters receded the work began of redefining and re-establishing the boundaries. This work was called geometry and was seen as a re-establishment of the principle of order and law on earth. Each year the areas measured out would be somewhat different. The human order would shift and this was reflected in the ordering of the earth. The Temple astronomer might say that certain celestial configurations had changed so that the orientation or location of a temple had to be adjusted accordingly. So the laying of squares upon the earth had, for the Egyptian, a metaphysical as well as a physical and social dimension. This activity of 'measuring the earth' became the basis for a science of natural law as it is embodied in the archetypal forms of circle, square and triangle.

Geometry is the study of spatial order through the measure and relationships of forms. Geometry and arithmetic, together with astronomy, the science of temporal order through the observation of cyclic movement, constituted the major intellectual disciplines of classical education. The fourth element of this great fourfold syllabus, the Quadrivium, was the study of harmony and music. The laws of **simple** harmonics were considered to be universals which defined the relationship and interchange between the temporal movements and events of the heavens and the spatial order and development on earth.

The implicit goal of this education was to enable the mind to become a channel through which the 'earth' (the level of manifested form) could receive the abstract, cosmic life of the heavens. The practice of geometry was an approach to the way in which the universe is ordered and sustained. Geometric diagrams can be contemplated as still moments revealing a continuous, timeless, universal action generally hidden from our sensory perception. Thus a seemingly common mathematical activity can become a discipline for intellectual and spiritual insight.

Plato considered geometry and number as the most reduced and essential, and therefore the ideal, philosophical language. But it is only by virtue of functioning at a certain 'level' of reality that geometry and number can become a vehicle for philosophic contemplation. Greek philosophy defined this notion of 'levels', so useful in our thinking, distinguishing the 'typal' and the 'archetypal'. Following the indication given by the Egyptian wall reliefs, which are laid out in three registers, an upper, a middle and a lower, we can define a third level, the ectypal, situated between the archetypal and the typal.

To see how these operate, let us take an example of a tangible thing, such as the bridle of a horse. This bridle can have a number of forms, materials, sizes, colours, uses, all **of which** are bridles. The bridle considered in this way, is typal; it is existing, diverse and variable. But on another level there is the idea or form of the bridle, the guiding model of all bridles. This is an unmanifest, pure, formal idea and its level is ectypal. But yet above this there is the archetypal level which is that of the principle or power-activity. that is a process which the ectypal **form and** typal example of the bridle only represent. The archetypal is concerned with universal processes or dynamic patterns which can be considered independently of any structure or

Geometry as a contemplative practice is personified by an elegant and refined woman, for geometry functions as an intuitive, synthesizing, creative yet exact activity of mind associated with the feminine principle. But when these geometric laws come to be applied in the technology of daily life they are represented by the rational, masculine principle: contemplative geometry is transformed into practical geometry.

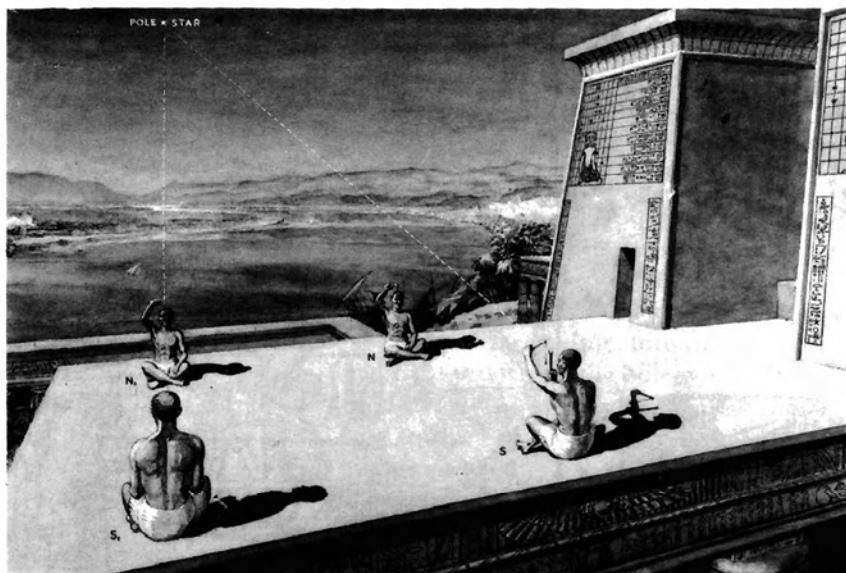


ABOVE Arithmetic is also personified as a woman, but not as grand and noble in attire as Geometry, perhaps symbolically indicating that Geometry was considered as a higher order of knowledge. On her thighs (symbolizing the generative function) are two geometric progressions. The first series, 1, 2, 4, 8, goes down the left thigh, associating the even numbers with the feminine, passive side of the body. The second series, 1, 3, 9, 27, goes down the right thigh, associating the odd numbers with the masculine, active side, an association which goes back to the Pythagoreans, who called the odd numbers male and the even female. The Greeks called these two series the *Lambda*, and Plato in the *Timaeus* uses them to describe the World Soul (see p. 83). On the woman's left sits Pythagoras using an abacus system for computation. In this system, number notation is still dependent upon spatial arrangement. Boethius sits on her right using Arabic numerals in a modern system of calculation in which number notation has become a separate, abstract system independent of its geometric origin.

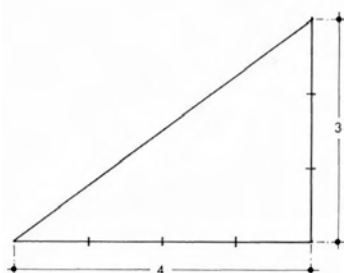


BELOW Pythagoras is credited with first establishing the relationship between number ratios and sound frequencies. He is shown here experimenting with bells, water-glasses, stretched cords, and various sized pipes; his Hebrew counterpart, Jubal, uses weighted hammers on an anvil. The whole number ratios for determining the consonant sounds in a musical scale are either drawn from or are multiples of the numbers in the two progressions of the *Lambda*.





The ancient astronomers designated the movement and position of celestial bodies through angular notation. The varied angular positions of the sun, moon, planets and stars were related to the cyclic changes in the natural world, such as moon phases, seasons, tides, plant growth, human and animal fertility, etc. It was the angle which specified the influences of celestial patterns on earthly events. (In this way we can appreciate the similar root of the words *angle* and *angel*.) Today the newly emerging science of heliobiology verifies that the angular position of the moon and planets does affect the electromagnetic and cosmic radiations which impact with the earth, and in turn these field fluctuations affect many biological processes.



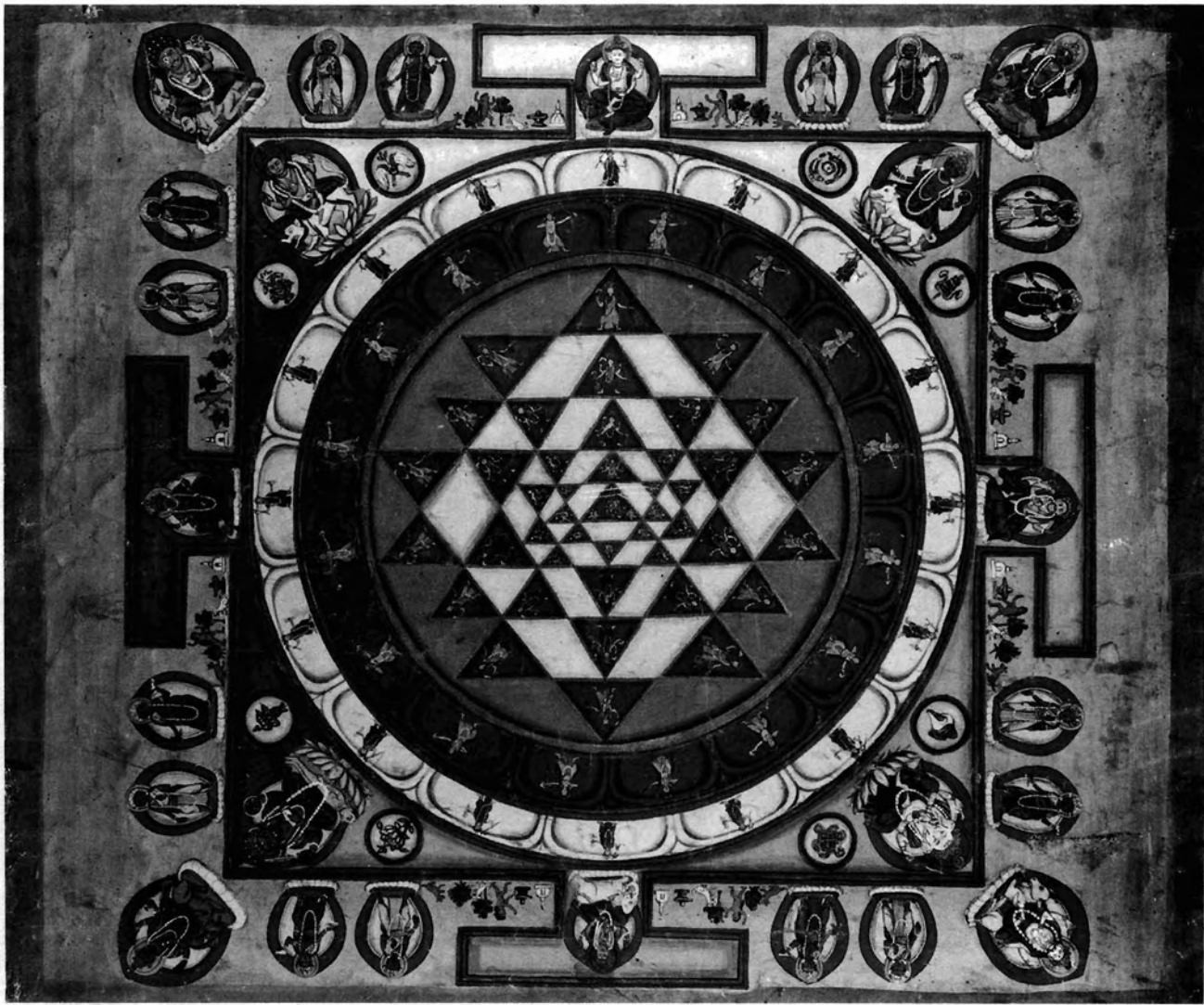
In ancient trigonometry an angle is a relationship between two whole numbers. In this example the angle at left is an expression of the ratio 3 to 4, and with this system spatial coordinates can easily be put into relationship with sound frequencies, such as the musical fourth (see p. 85).

material form. Modern thought has difficult access to the concept of the archetypal because European languages require that verbs or action words be associated with nouns. We therefore have no linguistic forms with which to image a process or activity that has no material carrier. Ancient cultures symbolized these pure, eternal processes as gods, that is, powers or lines of action through which Spirit is concretized into energy and matter. The bridle, then, relates to archetypal activity through the function of *leverage*; the principle that *energies are controlled, specified and modified through the effects & angulation*.

Thus we find that often the angle – which is fundamentally a relationship of two numbers – would have been used in ancient symbolism to designate a group of fixed relationships controlling interacting complexes or patterns. Thus the archetypes or gods represent dynamic functions forming links between the higher worlds of constant interaction and process and the actual world of particularized objects. We find, for example, that a 60" angle has quite different structural and energetic properties from an angle of 90° or of 45". Likewise, geometric optics reveals that each substance characteristically refracts light at its own particular angle, and it is this angle which gives us our most precise definition of the substance. Furthermore, the angles in the bonding patterns of molecules determine to a great extent the qualities of the substance.

In the case of the bridle, this angulation or angular play is manifested in the relation of the bit to the bridle strap, or between the bit and the bend of the horse's neck and jaw, both controlled by the angulation between the forearm and the biceps of the rider. From the level of the archetype or active Idea, the principle of the bridle can be applied metaphorically to many regions of human experience. For instance, when St Paul describes the process of self-discipline by which a higher intentionality attempts to control the lower, 'animal' nature, he says that when one can bridle the mouth he can then master the rest of his nature. But while at the archetypal level this image can be metaphysically and poetically expansive, it also finds its exact, geometrical representation in the *angle*. It is the precise angle of the arm in play with the angle of the bridle that controls the energy of the horse.

Functioning then at the archetypal level, Geometry and Number describe fundamental, causal energies in their interwoven, eternal dance. It is this way of seeing that stands behind the expression of cosmological systems as geometric configurations. For example, the most revered of all Tantric diagrams, the Sri Yantra, images all the necessary functions active in the universe through its nine interlocked triangles. To immerse oneself in such a geometric diagram is to enter into a kind of philosophic contemplation.



For Plato, Reality consisted of pure essences or archetypal Ideas, of which the phenomena we perceive are only pale reflections. (The Greek word 'Idea' is also translated as 'Form'.) These Ideas cannot be perceived by the senses, but by pure reason alone. Geometry was the language recommended by Plato as the clearest model by which to describe this metaphysical realm.

The Sri Yantra is drawn from nine triangles, four pointed downward and five pointed upward, thus forming 42 (6×7) triangular fragments around a central triangle. There is probably no other set of triangles which interlock with such integrational perfection.

And do you not know that they [the geometers] make use of the visible forms and talk about them, though they are not of them but of those things of which they are a likeness, pursuing their inquiry for the sake of the square as such and the diagonal as such, and not for the sake of the image of it which they draw? And so on in all cases . . . What they really seek is to get sight of those realities which can be seen only by the mind. PLATO, *Republic*, VII, 510 d, e.

The Platonist sees our geometrical knowledge as innate in us, having been acquired before birth when our souls were in contact with the realm of ideal being.

All mathematical forms have a primary subsistence in the soul; so that prior to the sensible she contains self-motive numbers; vital figures prior to such as are apparent; harmonic ratios prior to things harmonized; and invisible circles prior to the bodies that are moved in a circle. THOMAS TAYLOR

Plato demonstrates this in the *Meno* where he has an untutored servant boy solve by intuition the geometric problem of the doubling of the square.

For the human spirit caught within a spinning universe in an ever confusing flow of events, circumstance and inner turmoil, to seek truth has always been to seek the invariable, whether it is called Ideas, Forms, Archetypes, Numbers or Gods. To enter a temple constructed wholly of invariable geometric proportions is to enter an abode of eternal truth. Thomas Taylor says, 'Geometry enables its votary, like a bridge, to pass over the obscurity of material nature, as over some dark sea to the luminous regions of perfect reality.' Yet this is by no means an automatic happening that occurs just by picking up a geometry book. As Plato says, the soul's fire must gradually be rekindled by the effort:

You amuse me, you who seem worried that I impose impractical studies upon you. It does not only reside with mediocre minds, but all men have **difficulty** in persuading themselves that it is through these studies, as if with instruments, that one purifies the eye of the soul, and that one causes a new fire to burn in this organ which was obscured and as though extinguished by the shadows of the other sciences, an organ whose conservation is more important than ten thousand eyes, since it is by it alone that we contemplate the truth.

Republic, VII, 527 d, e
(as quoted by Theon of Smyrna (2nd c. AD) in his
Mathematics Useful for Understanding Plato)

Geometry deals with pure form, and philosophical geometry re-enacts the unfolding of each form out of a preceding one. It is a way by which the essential creative mystery is rendered visible. The passage **from** creation to procreation, from the unmanifest, pure, formal idea to the 'here-below', the world that spins out from that original divine stroke, can be mapped out by geometry, and experienced through the practice of geometry: this is the purpose of the 'Workbook' sections of this book.

Inseparable from this process is the concept of Number, and, as we shall see, for the Pythagorean, Number and Form at the ideal level were one. But number in this context must be understood in a special way. When Pythagoras said, 'All is arranged according to Number', he was not thinking of numbers in the ordinary, enumerative sense. In addition to simple *quantity*, numbers on the ideal level are possessed of *quality*, so that 'twoness', 'threeness' or 'fourness', for example, are not merely composed of 2, 3, or 4 units, but are wholes or unities in themselves, each having related powers. 'Two', for instance, is seen as the original essence from which the *power of duality* proceeds and derives its reality.

R.A. Schwaller de Lubicz gives an analogy by which this universal and archetypal sense of Number can be understood. A revolving sphere presents us with the notion of an axis. We think of this axis as an ideal or imaginary line through the sphere. It

The twelfth-century architecture of the Cistercian Order achieves its visual beauty through designs which conform to the proportional system of musical harmony. Many of the abbey churches of this period were acoustic resonators **transforming** a human choir into celestial music. St Bernard of Clairvaux, who inspired this architecture, said of their design, 'There must be no' decoration, only proportion.'





Christ is shown using compasses to re-enact the creation of the universe from the chaos of the primal state. This icon can also be understood as an image of individual self-creation; for here, as in many medieval images of Christ, Tantric symbolism is evident. Christ holds the compass with his hand across the vital centre called the heart chakra, and from this centre he organizes the turmoil of the vital energies contained in the lower chakras which are indicated on the body by centres at the navel and genitals. Geometry is symbolized here in both the individual and universal sense as an instrument through which the higher archetypal realm transmits order and harmony to the vital and energetic worlds.

has no objective existence, yet we cannot help but be convinced of its reality; and to determine anything about the sphere, such as its inclination or its speed of rotation we must refer to this imaginary axis. Number in the enumerative sense corresponds to the measures and movements of the outer surface of the sphere, while the universal aspect of Number is analogous to the immobile, unmanifest, functional principle of its axis.

Let us shift our analogy to the two-dimensional plane. If we take a circle and a square and give the value 1 to the diameter of the circle and also to the side of the square, then the diagonal of the square will always be (and this is an invariable law) an 'incommensurable', 'irrational' number. It is said that such a number can be carried out to an infinite number of decimal places without ever arriving at a resolution. In the case of the diagonal of the square, this decimal is **1.4142...** and is called the square root of 2, or $\sqrt{2}$. With the circle, if we give the diameter the value 1, the circumference will also always be of the incommensurable type, **3.14159...** which we know by the Greek symbol π , pi.

The principle remains the same in the inversion: if we give the fixed, rational value of 1 to the diagonal of the square and to the circumference of the circle, then the side of the square and the radius of the circle will become of the incommensurable 'irrational' type: $1/\sqrt{2}$ and $1/\pi$.

It is exactly at this point that quantified mathematics and geometry go their separate ways, because numerically we can never know exactly the diagonal of the square nor the circumference of the circle. Yes, we can round-off after a certain number of decimal places, and treat these cut off numbers like any other number, but we can never reduce them to a quantity. In geometry, however, the diagonal and the circumference, when considered in the context of *formal relationship* (diagonal to side; circumference to diameter), are absolutely knowable, self-evident realities: $1:\sqrt{2}$ and $1:n$. Number is considered as a *formal relationship*, and this type of numerical relationship is called a *function*. The square root of 2 is the functional number of a square. *Pi* is the functional number of a circle. Philosophic geometry – and consequently sacred art and architecture – is very much concerned with these 'irrational' functions, for the simple reason that they demonstrate graphically a level of experience which is universal and invariable.

The irrational functions (which we will consider rather as supra-rational) are a key opening a door to a higher reality of Number. They demonstrate that Number is above all a relationship; and no matter what quantities are applied to the side and to the diameter the relationship will remain invariable, for in essence this functional aspect of Number is neither large nor small, neither infinite nor finite: it is universal. Thus within the concept of Number there is a definite, finite, particularizing power and also a universal synthesizing power. One may be called the exoteric or external aspect of number, the other the esoteric or inner, functional aspect.

Let us look at the first four primary numbers in this spirit.

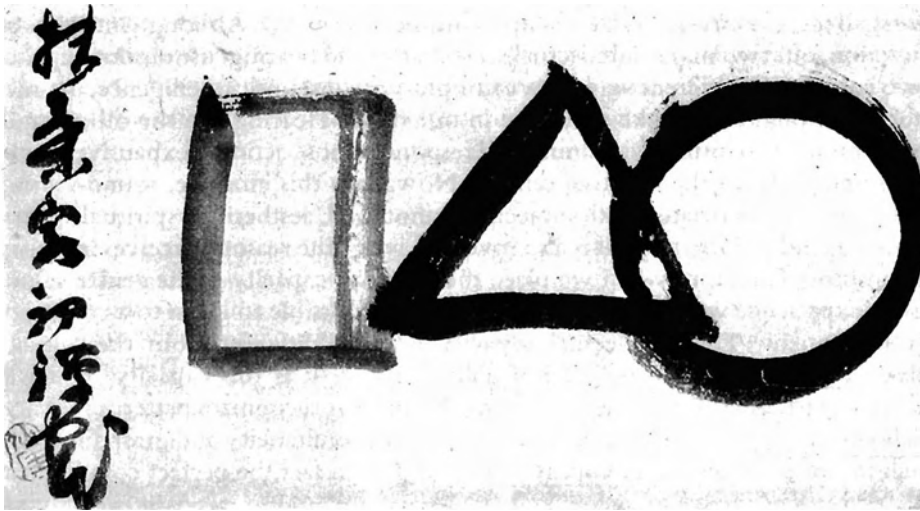
The number ONE can of course define a quantity; as, for example, one apple. But in its other sense, it perfectly represents the principle of absolute unity, and as such has often been used as the symbol to represent God. As a statement of form it can in one sense represent a point – it has been called the 'pointal' number, the *bindu* or seed in the Hindu mandala – or in another sense it can represent the perfect circle.

TWO is a quantity, but symbolically it represents, as we have already seen, the principle of Duality, the power of multiplicity. At the same time it has its formal sense in the representation of a line, in that two points define a line.

THREE is a quantity, but as a principle it represents the Trinity, a vital concept which we will meet again later. Its formal sense is that of the triangle, which is formed from three points. With three a qualitative transition is made from the pure, abstract elements of point and line to the tangible, measurable state which is called a *surface*. In India the triangle was called the Mother, for it is the membrane or birth channel through which all the transcendent powers of unity and its initial division into polarity must pass in order to enter into the manifest realm of surface. The triangle acts as the mother of form.

But three is yet only a principle of creation, forming the passage between the transcendent and the manifest realms, whereas FOUR represents at last the 'first born thing', the world of Nature, because it is the product of the procreative process, that is of multiplication: $2 \times 2 = 4$. As a form, four is the square, and represents materialization.

The universality of Number can be seen in another, more physical context. We learn from modern physics that from gravity to electromagnetism, light, heat, and even in what we think of as solid matter itself, the entire perceptible universe is composed of vibrations, perceived by us as wave phenomena. Waves are pure temporal patterns, that is dynamic configurations composed of amplitude, interval and frequency, and they can be defined and understood by us only through Number. Thus our whole universe is reducible to Number. Every living body physically



This Japanese Zen calligraphic drawing beautifully shows 'creation' through the simple progression from the Unity of the circle, through the triangle, to the manifest form of the square.

vibrates, all elemental or inanimate matter vibrates molecularly or atomically, and every vibrating body emits a sound. The study of sound, as the ancients intuited, provides a key to the understanding of the universe.

We've noted already that the ancients gave considerable attention to the study of musical harmony in relation with the study of mathematics and geometry. The origin of this tradition is generally associated with Pythagoras (560–490 BC) and his school, yet Pythagoras may be considered as a window through which we can glimpse the quality of the intellectual world of an older, eastern and mideastern tradition. For this line of thinking, the sounding of the octave (an octave is for example two successive 'Do's' on a musical scale) was the most significant moment of all contemplation. It represented the beginning and goal of creation. What happens when we sound the perfect octave? There is an immediate, simultaneous coinciding of understanding which has occurred on several levels of being. Without any intervention of thought or concept or image, we immediately recognize the recurrence of the initial tone in the form of the octave. It is the same note, yet it is different; it is the completion of a cycle, a spiral from seed to new seed. This timeless, instantaneous recognition (more accurate than any visual recognition) is universal among humans.

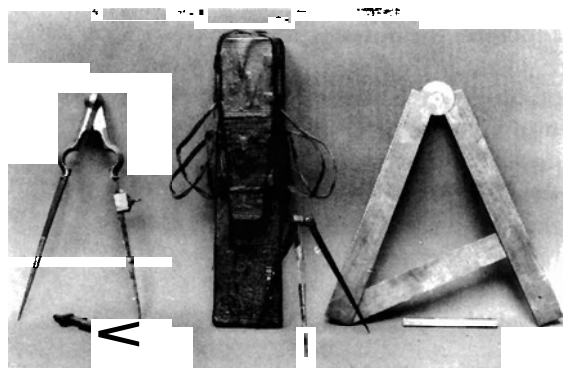
But something else has happened as well. A guitarist sounds a string. He next depresses this string with his finger exactly at its midpoint. He sounds the half-string. The frequency of vibrations produced is double that given by the whole string, and the tone is raised by one octave. The string length has been divided by two, and the number of vibrations per second has been multiplied by two: $1/2$ has created its mirror opposite, $2/1$. Thus in this moment an abstract, mathematical event is precisely linked with a physical, sensory perception; our direct, intuitional response to this phenomenon of sound (the octave) coincides with its concrete, measured definition.

Hence we experience in this auditory perception a simultaneous interwovenness of interior with exterior, and we can generalize this response to invoke the possibility of a merger of intuitional and material realms, the realms of art and science, of time and space. There may be another such moment in the created world, but the Pythagoreans did not know of it, nor do we. This is the essential spirit of the perception of Harmony, and for the Pythagoreans it was the only true supernatural moment: a tangible experience of the simultaneity of opposites. It was considered to be true Magic, an omnipresent and authentic mystery.

It was by means of geometry that the Pythagoreans poised themselves at this unique transition where heard vibration becomes seen form; and their geometry, as we shall see, explores the relationships of musical harmony. Although interwoven in function, our two major intellectual senses, sight and hearing, use our intelligence in two completely different ways. For example, with our optic intelligence, in order to form a thought we make an image in our mind. Hearing, on the other hand, uses the mind in an immediate, unimaged response whose action is expansive, evoking a response from the emotive centres. Nowadays this emotive, sound-sensing faculty is usually associated with subjective, emotional, aesthetic or spiritual experiences. We tend to forget that it is also involved when the reason perceives invariant relationships. Therefore when we place the auditory capacity at the centre of our sensory experience we can become aware that it is possible to listen to a colour, or to a movement. This intellectual capacity is quite different from the 'visual', analytical and sequential one we normally employ. It is this capacity, which is associated with the right hemisphere of the brain, that recognizes patterns in space, or wholes of any kind. It can perceive opposites in simultaneity and grasp functions which to the analytic faculty appear irrational. It is in fact the perfect complement of the 'left hemisphere', visual, analytic capacity, for it absorbs spatial and simultaneous orders while the 'left' rational faculty is best suited to grasp temporal, sequential organization. The esoteric, **functional** aspect of Number, for instance, would be apprehended through the 'right hemisphere' faculty, while the exoteric, enumerative aspect of Number is apprehended by the 'left'.

This innate intellectual quality resembles very closely what the Greeks called Pure Reason, or what in India was called the 'heart-mind'. The ancient Egyptians had a beautiful name for it, the Intelligence of the Heart, and to achieve this quality of understanding was life's implicit goal. The practice of Geometry, while also utilizing the analytic faculty, uses and cultivates this audial, intuitive aspect of mind. For example, one experiences the fact of geometric growth through the image of the square with its diagonal which forms the side of a second square. This is an unreasoned certainty absorbed by the mind from the actual experience of executing the drawing. The logic is contained within the lines on paper, which cannot be drawn in any other way.

As geometers, equipped only with compasses and straight-edge, we enter the two-dimensional world of the representation of form. A link is forged between the most concrete (form and measure) and the most abstract realms of thought. By seeking the invariable relationships by which forms are governed and interconnected we bring ourselves into resonance with universal order. By re-enacting the genesis of these forms we seek to know the principles of evolution. And by thus raising our own patterns of thought to these archetypal levels, we invite the force of these levels to penetrate our mind and thinking. Our intuition is enlivened, and perhaps, as Plato says, the soul's eye might be purified and kindled afresh 'for it is by it alone that we contemplate the truth'.



'Numbers are the sources of form and energy in the world. They are dynamic and active even among themselves . . . almost human in their capacity for mutual influence.' (Theon of Smyrna.) Numbers, in the Pythagorean view, can be androgynous or sexual, procreators or progeny, active or passive, heterogeneous or promiscuous, generous or miserly, undefined or individualized. They have their attractions, repulsions, families, friends; they make marriage contracts. They are in fact the very elements of nature. The tools of geometry and number represent the means to attain knowledge of both external and internal space and time. These instruments, once used by architects and philosophers, became instead, from the time of the 'Age of Reason', the tools of the engineer.

It seems to be the basic assumption of traditional philosophies that human intellectual powers are for the purpose of accelerating our own evolution beyond the restraints of the biological determinism which binds all other living organisms. Methods such as yoga, meditation, concentration, the arts, the crafts, are psycho-physical techniques to further this fundamental goal. The practice of Sacred Geometry is one of these essential techniques of self-development.

Each of the diagrams in the small squares represents a different system or technique of thought for understanding the world and its structures. The first task of the spiritual aspirant confronting the varied contemplative paths is to harmonize the five universal constituents which compose his body (earth, air, fire, water and prana). His clear cognition of the outer and inner worlds is dependent upon the harmonious accord which he establishes between these elemental states in his own body and these same elements in nature. Each geometric cosmogram is meant to assist him in these attempts at liberation through harmonization.

